

Connect Casing to Vapor Recovery Unit



Partner Reported Opportunities (PROs)
for Reducing Methane Emissions

PRO Fact Sheet No. 701

Applicable sector(s):

Production Processing Transmission and Distribution

Partners reporting this PRO: Marathon Oil Company

Other related PROs: Pipe Glycol Dehydrator to VRU, Install Flares, Reroute Glycol Skimmer Gas, Reinject Blowdown Gas into Low Pressure Mains

Compressors/Engines
Dehydrators
Pipelines
Pneumatics/Controls
Tanks
Valves
Wells
Other

Technology/Practice Overview

Description

Crude oil and natural gas wells that produce through tubing may collect methane and other gases in the annular space between the casing and tubing. This gas, referred to as casing head gas, is often vented directly to the atmosphere. One way to reduce methane emissions is to connect the casing head vent to an existing vapor recovery unit (VRU).

VRUs are finding wider application at production sites with multiple oil or condensate storage tanks that have significant vapor emissions. This practice takes advantage of the similarities in gas pressure, composition, and rates between tank emissions and casing head gas.

Operating Requirements

Pressure regulators would be necessary if low pressure casing head gas is combined with higher pressure sources (e.g., dehydrator flash tank separator) at a VRU suction. Only small diameter piping is required to join a casing head vent to the VRU suction.

Applicability

This option is applicable at wells producing through tubing with packerless completions.

Methane Emissions Reductions

Casing head gas vents vary widely in quantity and methane content. One partner reported an annual average casing head gas methane recovery of 7,300 Mcf per year over a five-year period. This may be equivalent to about 10,000 Mcf per year of gas containing 73 percent methane.

Methane Savings: 7,300 Mcf per year

Costs

Capital Costs (including installation)

<\$1,000 \$1,000 – \$10,000 >\$10,000

Operating and Maintenance Costs (annual)

<\$100 \$100-\$1,000 >\$1,000

Payback (Years)

0-1 1-3 3-10 >10

Benefits

Reducing methane emissions was a primary justification for the project.

Economic Analysis

Basis for Costs and Savings

Methane emission reductions of 7,300 Mcf per year are the partner savings from connecting one well to an existing VRU.

Discussion

This technology can pay back quickly. Revenue from gas recovery will pay back the piping cost and the incremental electrical power required by the VRU to inject the gas into a 100 psig system. At 7.5¢ per kWh, the partner reported gas recovery would increase electricity costs by \$3,400 per year.